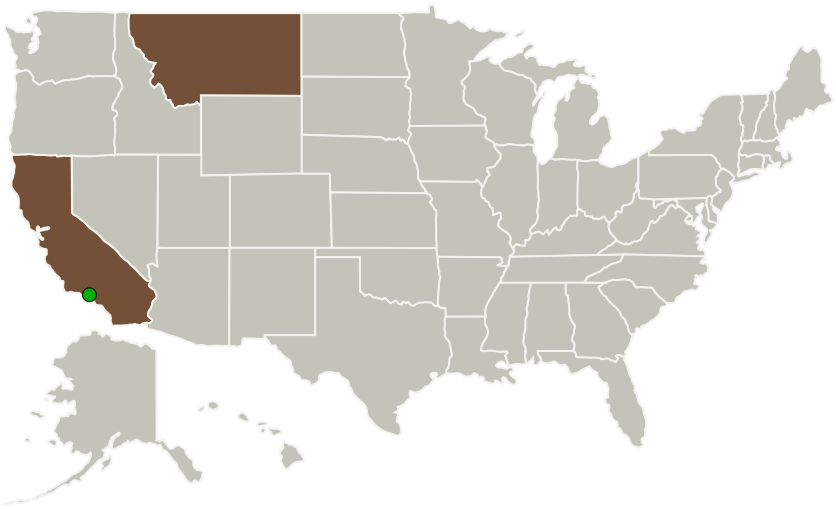
Multi-Channel Tunable Source for Atomic Sensors, Phase I

Completed Technology Project (2014 - 2014)

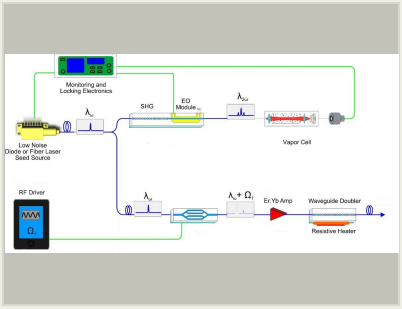
Project Introduction

This Phase I SBIR will establish the feasibility of developing compact, robust, integrated components suitable for atomic interferometry. AdvR's design is enabled by capitalizing on robust, well-commercialized, low-noise telecom components with high reliability and declining costs which will help to drive the widespread deployment of this system. The key innovation is the combination of current telecom-based fiber laser and modulator technology with periodically-poled waveguide technology to produce tunable laser light at rubidium D1 and D2 wavelengths (and expandable to other alkalis) using second harmonic generation (SHG). With this technology, multiple channels can be independently tuned to produce the fields needed for addressing atomic states in atom interferometers and clocks. In addition, this technology could be useful in the development cold-atom inertial sensors and gyroscopes.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
ADVR, Inc.	Lead Organization	Industry	Bozeman, Montana
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California



Multi-channel tunable source for atomic sensors Project Image

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Primary U.S. Work Locations	
California	Montana

Project Transitions

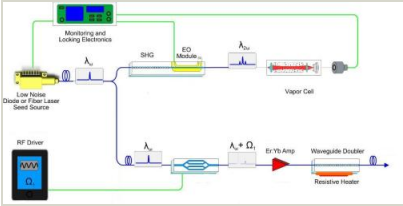
June 2014: Project Start

December 2014: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140583)*

Images



Project Image
Multi-channel tunable source for atomic sensors Project Image *(https://techport.nasa.gov/image/125847)*

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
ADVR, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

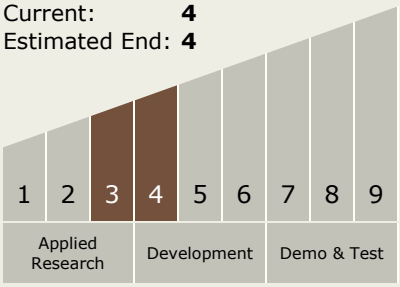
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Matthew Bigelow

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.5 Lasers

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System